**THINKING ABOUT PROBABILITY**

1. Suppose you go to the store and there are six kinds of cereal. Your mom tells you to pick one. When she comes back, you ask her to guess which one you chose. Assuming she had no idea beforehand what your choice would be, how likely is it that she will guess the correct one?
2. Let’s say you are playing a coin-tossing game with a friend. You toss the same coin 500 times, and 400 times it comes up heads. Would this be normal? What could explain it?
3. You are bored one day, so you start rolling a die. You roll it 10 times and you get a 6 eight of the times. You think this is strange, so you keep rolling. You roll 100 more times and only get eight more 6s, leaving a total of 16. What is the rule that accounts for this scenario?
4. What is the relative frequency of the final total of the 6’s rolled in Question 3?
5. Someone hands you a standard deck of 52 cards. There are four queens. What is the likelihood that you will draw a queen from the deck the first try?
6. You and a friend (who has no understanding of probability) are at the mall on a hot Tuesday afternoon in the middle of the summer. She offers to buy you a snow cone if you can guess the types of dollar bills she has in her wallet in fewer than three guesses. She tells you she has $20 and none of the bills are $1’s or a $20. If you don’t guess correctly by the third try, you have to give her a quarter. Are your odds of guessing correctly greater than ½?

**Answer key**

1. 1/6
2. No, it would not be normal. Most likely, either a trick is being played or there is something wrong with the coin.
3. The Law of Large Numbers
4. 16/100
5. 4/52
6. Since she has no $1s or a $20, only three possible combinations equal $20, and she’s giving you three guesses. Therefore, you have a greater than ½ chance of guessing correctly.